



State of North Carolina
Department of
Natural and Economic Resources
Raleigh 27611

JAMES E. HOLSHOUSER, JR.
GOVERNOR

January 8, 1975

JAMES E. HARRINGTON
SECRETARY
TELEPHONE
AREA CODE 919-829-4984

The Honorable James B. Hunt, Jr.
President of the Senate
State of North Carolina
State Legislative Building
Raleigh, North Carolina 27601

Dear Jim:

Chapter 1029, 1973 General Session Laws enacted by the 1974 General Assembly, directed the Secretary of the Department of Natural and Economic Resources to "conduct studies, hold hearings, and make recommendations to the 1975 General Assembly concerning legislation:

- (1) Designed to assure the continuous growing and harvesting of forest tree species and to protect the soil, air, and water resources; including--but not limited to--streams, lakes, and estuaries; and
- (2) Designed to coordinate activities among state agencies that are concerned with the forest environment."

The Secretary was further authorized to "appoint a Forest Practices Act Study Committee for the purpose of holding hearings and making recommendations to the Secretary concerning the purposes of (the) Act."

The Bill directed that the Committee be composed of 11 voting members. "Not less than six of the members may be private forest landowners, private forest operators, or authorized representatives of private forest landowners who engage in operations. All members of the Committee shall be qualified by education or experience in natural resource management."

The Legislative charge of the Committee stated that "the Committee shall prepare and submit to the Secretary . . . a report covering the need for legislation to regulate forest practices; and if necessary, specific recommendations concerning appropriate legislation which the Committee determines to be necessary to implement the findings of its study."

Upon receipt of recommendations from the Committee, the Secretary was directed to prepare a report for the 1975 General Assembly concerning the need for legislation to regulate forest practices.

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This report is hereby submitted pursuant to the directive of Chapter 1029, 1973 General Session Laws.

A summary of the conclusions of the Study Committee is attached, together with a report of action taken or contemplated in response to the Committee's recommendations. We are also attaching our recommendations for consideration by the General Assembly.

Sincerely,

James E. Harrington

enclosures: Conduct of Study
Summary of Conclusions
Committee Recommendations and Department Response
Report of Forest Practices Act Study Committee

CONDUCT OF STUDY

The Committee began work by familiarizing itself with existing state and federal legislation, forest practices regulation in other states, and public issues surrounding forest practices regulation. Trips were made to Washington, Oregon, California, and Maine to observe forest practices and administrative approaches to forest practices regulation in those states.

Field trips were taken in North Carolina to observe techniques and methods being used in forestry operations and the impact of these practices on the resource and the environment. Fifteen counties and 70 sites were visited. This included all regions of the state.

Four public hearings were held at strategic locations within the state to obtain ideas and suggestions from the public relative to the status of forest practices and the need for forest practices regulation in North Carolina.

In addition to the preceding activities, the Committee involved the Department's Division of Forest Resources in a statewide survey to evaluate the present status of forest practices and their short-term impact on the forest resource and environment. The Department's foresters inspected and evaluated over 700 recent forestry operations in every county of the state.

The Committee spent a total of 454 man-days on official duties related to its charge.

SUMMARY OF CONCLUSIONS

FOREST PRACTICES ACT STUDY COMMITTEE REPORT

The Committee arrived at the following conclusions:

- A. The complexity of designing and administering a comprehensive forest practices act justifies greater time commitments for study and formulation than have been available to the Committee.
- B. Voluntary compliance with standard guidelines for forest practices is preferable to enforced regulation. A program of education, training, and financial incentives to encourage compliance is desirable. However, regulation must be considered if voluntary compliance fails.
- C. Unfavorable environmental impacts from forest practices are occurring. Although currently of a local and sporadic nature, they are of sufficient concern to warrant continuing study of methods to minimize these impacts.
- D. Regeneration of unproductive forest land is a high priority problem requiring prompt attention and action.
- E. The administration of any program directed toward the improvement of forest practices requires a unity of philosophy and purpose on the part of all governmental units involved. The control of such a program must be vested in one office.
- F. North Carolina's diverse and varied forested regions require flexibility in the adoption of standard operating procedures or guidelines.
- G. Limitations imposed by availability of markets for all potentially merchantable material constitute a major block to improved forest practices.
- H. A serious drawback to better forest practices in the Mountain and Piedmont regions of the state is a lack of knowledge about intensive hardwood culture and management.
- I. Prevention of soil and water damage associated with harvesting and cultural practices is relatively easy to achieve; that is, the know-how is available and costs for doing it are not prohibitive. This is not always true of the regeneration problem.
- J. The large number of small private forest owners (nearly 250,000) and the number of "operations" each year (about 25,000) make a tight, comprehensive system of permits, inspections, reports, and appeals impracticable. The cost and work load of administering such a system would be very great.

COMMITTEE RECOMMENDATIONS AND DEPARTMENT RESPONSE

The Forest Practices Act Study Committee's recommendations can be categorized as those that: (1) can be accomplished with administrative action, (2) require further staff study, or (3) require legislative or regulatory Commission action.

I concur with the following Committee recommendations which may be implemented immediately by administrative action:

- a. Delegation to the Forestry Council of the Department of Natural & Economic Resources certain functions and responsibilities to assure improvement of the forest resource base and protection of its environmental quality. These functions include establishment and implementation of standard guidelines for the conduct of forest practices, the continuation of studies and evaluations of forest practices, and the coordination of forestry efforts among principal agencies, commissions, and citizen groups.
- b. Appointment of three seven-member Regional Forest Practices Advisory Committees to function in each of the three geographic regions of the state. These committees will serve to develop regional guidelines for forest practices and to advise the Forestry Council on technical matters.
- c. Development and voluntary adoption of regional guidelines to improve the impact of forest practices on: (1) forest productivity and site capability, (2) wildlife and endangered species habitat, (3) visual quality, and (4) water quality.

The above actions can be initiated administratively. However, to assure continuity of these program efforts, there should be a legislative directive to continue this comprehensive long-range program. This directive is hereby respectfully requested, and a draft of proposed legislation is attached.

I concur with the Committee's recommendations concerning areas that require further staff study and am directing the Division of Forest Resources of this Department to make the following staff studies:

- a. Long-range timber productivity goals

Representatives from the forestry community of the state, acting as a council of forestry leaders, have recently compiled a long-range forestry plan for North Carolina. This plan received considerable input from the staff of the Division of Forest Resources. It defines problems and establishes timber productivity goals for the future. The plan will be used as a nucleus for developing targets and establishing timetables for timber production in the state.

- b. Feasibility of a state forestry incentives program

A staff study will be made to determine the need and practicality of a state forestry incentives program to supplement, or replace if necessary, the federal incentives program. Feasibility and funding will be scrutinized, and a legislative proposal for such a program will be made in the future if positive evidence indicates an incentives program is practical and in the best interest of the public.

- c. Strengthening of state forestry programs of landowner assistance and support of incentives program

The federal Forestry Incentives Program is resulting in an increased demand for key services and programs provided by the Division of Forest Resources to the residents of North Carolina. These programs--Forest Management, Forestation, Nurseries, and Tree Improvement--are currently operating at capacity levels in efforts to meet the state's objectives in timber production and the protection of environmental quality. A staff study will be conducted to investigate ways and means of strengthening the direction and the funding of these vital programs to meet these increased demands for services.

- d. Development of programs to train, control, and reward operators to minimize destructive logging, poor site preparation, wasteful utilization, and environmental degradation

It is recognized that major site abuse results from an unawareness on the part of equipment operators relative to the impact of their actions on environmental quality. Therefore, a necessary first step toward problem solution is a vigorous education program directed toward forest practices operators. A staff study will be designed to outline machinery and procedures for such a program, review success of the program, and recommend more stringent control action if needed to further improve forest operations.

- e. Harvest system research and development

It is recognized that there is a critical need for harvesting systems and related equipment designed to conduct thinnings and partial cuts in small timber stands. Personnel of the Division of Forest Resources are being directed to identify research projects to develop new silvicultural and harvest systems, outline an equipment development program to support the proposed systems, seek funding to support the systems' development costs, and encourage forestry research organizations to assign a high priority to this problem area.

- f. Catastrophic disasters

A staff effort will be initiated to strengthen wildfire, insect, and disease control capability and our ability to recover losses from catastrophic disasters by:

1. Supporting intensified research in wildfire, insect, and disease control.
2. Investigating fiscal procedures that will allow a revolving fund for the Division of Forest Resources to finance emergency control measures.

3. Investigating the practicality of storing damaged wood to prolong merchantability.

g. Study of forest taxation

Tax incentives for the practice of desirable forest management have been suggested as a possible measure to encourage landowners to improve their forestry practices. General Statute 105.277.2-7 (Present Use Tax Bill) provides certain advantages to forest landowners. However, brief experience in the administration of this statute indicates the possibility of statutory or administrative limitations which may be curtailing the most effective use of this legislation. The Division of Forest Resources is being directed to evaluate the results of this legislation and to propose administrative changes and/or legislative amendments to improve its effectiveness.

h. Feasibility of initiating steps to accomplish state surveillance and control of forestry practices

Recommendations were made by the Study Committee to consider possible control of forest practices. Basic to any control program is knowledge of when the practice is initiated and who the responsible party is. The Committee concluded that, under present operating procedures, this information was difficult, if not impossible, to obtain. Several alternatives--i.e., notification by the landowner of intent to harvest timber; registration, certification, or licensing of the forest operators, consulting foresters, or professional foresters--were suggested to deal with this problem.

Additionally, it has been learned that the North Carolina Subsection of the Society of American Foresters will seek legislation requiring the registration of professional foresters. If this legislation is favorably received, it would bring under state regulation a large sector of the forestry profession in North Carolina and be a decisive step in regulating these professionals whose activities directly affect the protection of the state's forest resources and environmental quality.

Because of the large number of individual landowners, forest operators, and forest operations involved annually, the Division of Forest Resources is being directed to study the possible surveillance and control methods and determine the most feasible method of control meeting both the needs of the people of North Carolina and of the state's forest resources.

I concur with the Committee's recommendations concerning areas that require amendments to existing legislation or the passage of new legislation and am in support of the following changes and additions to the state statutes:

- a. The Study Committee has recommended prompt implementation of the smoke management plan for forestry prescribed burning which was developed and has been under field evaluation by the Department's Division of Forest Resources. A smoke management system identifies

the amount of burning that can be done under various weather conditions without having an adverse impact on air quality in populated areas. This system can be implemented through action by the Environmental Management Commission. However, the brush burning permit laws (G.S. 14-139 and 1963 Session laws, Chapter 617) administered by the Division of Forest Resources for the prevention of forest fires must be amended to allow proper implementation of the smoke management system. Specifically, these statutes limit the cancellation of permits and the prohibition of burning to the Secretary and only at such times it is determined that hazardous forest fire conditions exist. Consequently, under the existing statute a brush burning permit can and must be issued by a permit agent designated by the Secretary for burning that is in violation of existing Rules and Regulations Governing the Control of Air Pollution promulgated by a commission of this Department.

The proposed amendments as per attachment #1 would correct this problem by allowing the Secretary to cancel permits and his agents to refuse to issue permits when the burning involved is in violation of existing air pollution control rules and regulations. The amendments would also reduce the public's confusion in regard to the two open burning regulatory systems by removing and clarifying exceptions to the brush burning permit requirements. Forestry personnel have given assurance that these changes would not materially reduce the effectiveness of their fire prevention program. In contrast, it is their opinion that closer administration of the two programs would have a beneficial effect on the fire control program.

- b. General Statutes 77-13 and 77-14 prohibit the felling of trees or the deposit of logging debris in streams and waterways. Effective use of this law has been hampered because responsibilities for enforcement have not been clearly defined. The Study Committee recommended that responsibilities for enforcing these two statutes be placed in the Department of Natural & Economic Resources. I concur with their recommendation and request that G.S. 77-13 and G.S. 77-14 be amended as per attachment #2 of this report.
- c. The Committee recognized that the complexity of issues and the need for further evaluations related to forest practices required much more time than was available. To assure continuity of the program efforts of the Forest Practices Study Committee, the Committee recommended that a legislative directive to continue this comprehensive long-range program be sought.

In response to this recommendation, attachment #3, a proposal to continue the activities of the Forest Practices Study Committee is respectfully submitted for your consideration.

RECOMMENDED CHANGES TO BRUSH BURNING PERMIT LAWS

The present Brush Burning Permit laws should be amended with the following provisions to replace it.

AN ACT TO AMEND CHAPTER 14 OF THE GENERAL STATUTES OF NORTH CAROLINA AND CHAPTER 617 OF THE 1963 SESSION LAWS.

The General Assembly of North Carolina enacts:

SECTION 1. Section 139, Chapter 14 of the General Statutes of North Carolina is amended to read as follows:

Starting Fires Within Five Hundred Feet of Areas Under Protection of State Forest Service---It shall be unlawful for any person, firm or corporation to start or cause to be started any fire or ignite any material in any of the areas of woodlands under the protection of the Department of Natural and Economic Resources or within five hundred (500) feet of any such protected area, during the hours starting at midnight and ending at 4:00 p.m. without first obtaining from the Secretary of the Department of Natural and Economic Resources, or his delegee a permit to start or cause to be started any fire or ignite any material in such above mentioned protected areas. No charge shall be made for the granting of said permits.

During periods of hazardous forest fire conditions or during air pollution episodes declared by competent authority pursuant to Article 21 of Chapter 143 of the General Statutes of North Carolina, the Secretary of the Department of Natural and Economic Resources is authorized to cancel all permits and prohibit the starting of any fires in any of the woodlands under the protection of the Department of Natural and Economic Resources or within five hundred (500) feet of any such protected area. The Secretary, or his delegee, may refuse to issue a permit when the burning to be conducted under this section is in violation of existing Rules and Regulations Governing the Control of Air Pollution adopted by competent authority under Article 21 of Chapter 143 of the General Statutes of North Carolina.

This section shall not apply to any fires started, or caused to be started, within one hundred (100) feet of an occupied dwelling house, if such fire shall be confined within an enclosure from which burning material may not escape, or within a protected area upon which a watch is being maintained and which is provided with adequate fire protection equipment.

Any person, firm or corporation violating any of the provisions of this section shall be guilty of a misdemeanor and upon conviction shall be fined not more than fifty dollars (\$50.00) or imprisoned for a period of not more than thirty (30) days, or both, in the discretion of the court.

The provisions of the above section shall not apply to Dare, Hyde, Tyrrell and Washington Counties. (1937, c. 207; 1939, c. 120; 1953, c. 915; 1963 Session Laws, Chap 617

SECTION 2. Chapter 617, 1963 Session law, is amended to read as follows:

It shall be unlawful for any person, firm or corporation to willfully start, or cause to be started, any fire, in any of the areas of woodlands under the protection of the Department of Natural and Economic Resources or within 500 feet of any such protected area without first having obtained from the Secretary of the Department of Natural and Economic Resources, or his delegee, a permit to start and burn such fire in the above mentioned protected areas.

During periods of hazardous fire conditions, or during air pollution episodes declared by competent authority pursuant to Article 21 of Chapter 143 of the General Statutes of North Carolina, the Secretary of the Department of Natural and Economic Resources is authorized to cancel all permits and to prohibit all brush pile burning and burning of other debris capable of spreading fires to woodlands without regard to the distance from such fires to such woodlands.

It shall be unlawful for any person, firm or corporation to willfully burn any debris, stumps, brush or other inflammable material accumulated as a result of ground clearance activities without having first received a special burning permit from the Secretary of the Department of Natural and Economic Resources, or his delegee, and such special permit shall be granted by the Secretary, or his delegee, only if he has personally inspected the site of the proposed burning, and has assessed the conditions which might endanger protected woodlands as a result of such burning. The Secretary, or his delegee, shall be empowered to prohibit all brush burning and burning of other debris capable of spreading fire to protected woodlands regardless of the distance such burning operation may be from the said woodlands, when it is determined that hazardous fire conditions exist or an air pollution episode is declared by competent authority pursuant to Article 21 of Chapter 143 of the General Statutes of North Carolina. No charge shall be made for the granting of any permit required by this section.

The Secretary of the Department of Natural and Economic Resources, or his delegee, may refuse to issue a permit when the burning to be conducted under this section is in violation of existing Rules and Regulations Governing the Control of Air Pollution adopted by competent authority under Article 21 of Chapter 143 of the General Statutes of North Carolina.

If a fire is discovered burning in any area of the State under any conditions which are considered by the Secretary of the Department of Natural and Economic Resources, or his delegee, to be hazardous to the protected forest in the vicinity or in violation of existing Rules and Regulations Governing the Control of Air Pollution adopted by competent authority under Article 21 of Chapter 143 of the General Statutes of North Carolina, the Secretary, or any delegee, is hereby empowered to enter upon the lands where such burning is occurring and, at their option, to extinguish such fires constituting a danger to adjoining woodlands or in violation of said Rules and Regulations Governing the Control of Air Pollution.

This section shall not apply to any fires started, or caused to be started, within 100 feet of an occupied dwelling house, if such fire shall be confined within an enclosure from which burning material may not escape, or within a protected area upon which a watch is being maintained and which is provided with adequate fire protection equipment.

Any person, firm or corporation violating any of the provisions of this section shall be guilty of a misdemeanor and upon conviction shall be fined not more than fifty dollars (\$50.00) or imprisoned for a period of not more than thirty (30) days.

The provisions of this section shall apply only to the Counties of Dare, Hyde, Tyrrell and Washington. (1963 Session Laws, Chapter 617).

RECOMMENDED AMENDMENT TO CHAPTERS 77-13 AND 77-14

AN ACT TO AMEND CHAPTER 77 OF THE GENERAL STATUTES OF NORTH CAROLINA

The General Assembly of North Carolina enacts:

Section 1. Sections 13 and 14, Chapter 77, are amended by adding the following section to each:

This section may be enforced by specially commissioned peace officers of the Department of Natural & Economic Resources.

AN ACT RELATING TO A FORESTRY STUDY

The General Assembly of North Carolina enacts:

Section 1. Short Title. This act shall be known as the Forestry Study Act.

Section 2. Definitions. As used in this act:

(a) "Secretary" means the Secretary of the Department of Natural & Economic Resources.

(b) "Forest practice" means any activity conducted on or directly pertaining to forest land and relating to growing, harvesting, or processing timber, including, but not limited to:

- (1) Road and trail construction and maintenance,
- (2) Harvesting,
- (3) Precommercial thinning,
- (4) Reforestation,
- (5) Fertilization,
- (6) Prevention and suppression of diseases and insects,
- (7) Salvage of trees, and
- (8) Brush control.

"Forest practices" shall not include preparatory work, such as tree marking, surveying, and road flagging and removal or harvesting of incidental vegetation from forest lands, such as berries, ferns, greenery, mistletoe, herbs, mushrooms, and other products which cannot ordinarily be expected to result in damage to forest soils, timber, or public resources.

Section 3. General Findings. Purpose of act:

(a) As authorized by the 1973 General Assembly (2nd session), the Forest Practices Study Committee was created to investigate forest practices within the state. The following findings were reported by this committee:

- (1) Unfavorable environmental impacts, although currently of a local and sporadic nature, are occurring as a result of forest practices. It is imperative that corrective action be developed now to prevent more serious problems in the future.
- (2) Regeneration of unproductive forest land is a high-priority problem requiring prompt attention and action.
- (3) The technical knowledge exists to design standard operating procedures or guidelines for harvesting and cultural practices which would minimize damage to the soil and water resource. This is not the case with respect to the problem of forest regeneration.
- (4) This state's diverse forest regions require flexibility in the design and administration of such standard operating procedures or guidelines.
- (5) A comprehensive program of education, training, and financial incentives to encourage voluntary compliance with these standard guidelines for forest practices is preferable to enforced

regulation. The complexity of developing such programs requires more time for study and evaluation than was available to the committee.

(b) The purpose of the act is to direct the Secretary of the Department of Natural & Economic Resources to conduct continuing studies and investigations and make recommendations to future sessions of the General Assembly. These investigations and recommendations should be:

- (1) Designed to assure the continuous growing and harvesting of forest tree species and to protect the soil, air, and water resources, including, but not limited to, streams, lakes, and estuaries;
- (2) Designed to coordinate activities among state agencies that are concerned with the forest environment;
- (3) Designed to develop programs to deal with emerging forestry problems, including, but not limited to, forest taxation, forest incentives, and forest practices;
- (4) Designed to keep the General Assembly fully informed concerning forestry and its related problems and needs; and
- (5) Designed to develop needed legislation to further the purposes of this act.

Section 4. Duties, Powers of the Secretary. The Secretary, in carrying out the policy and purposes of this act, shall:

- (a) Conduct continuing studies and investigations

concerning the purposes of this act.

- (b) Continue the work of the Forest Practices Study Committee in investigating the need for forest practices legislation.
- (c) Develop regional guidelines for forest practices within the state.
- (d) Appoint a citizen advisory committee in each of the three geographic regions of the state (Coastal Plain, Piedmont, and Mountain) as may be deemed necessary.
 - (1) Each advisory committee should be composed of seven members representing various interests and residing in the geographic area and should provide technical advice and assistance to the Secretary in all matters relating to regional forest practices.
 - (2) For each advisory committee three members shall be appointed initially for a one-year term and four members, for a two-year term. At the termination of the first year's term, all appointments shall be for a two-year term.
 - (3) The members of the committee shall receive as compensation per diem and necessary travel and subsistence expenses in accordance with the provisions of G.S. 138-5.
- (e) Prepare a report to the 1977 General Assembly and succeeding biennial sessions concerning the status of forestry in North Carolina.

(f) Provide to any appointed citizen advisory committee
necessary secretarial and professional staff assistance.

Section 5. This act shall become effective upon ratification.

REPORT OF
NORTH CAROLINA FOREST PRACTICES STUDY COMMITTEE

DECEMBER 15, 1974

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SUMMARY

The 1974 General Assembly authorized the Secretary of Natural and Economic Resources to appoint an 11-member Forest Practices Study Committee. The Committee was directed to study and report on the need for legislation to regulate forest practices in North Carolina and, if necessary, make specific recommendations concerning legislation required to implement the Committee's findings.

The Committee's activities during the course of its seven month tenure have included reviews of forest practices acts and regulation in other states, examination and evaluation of forest practices in North Carolina, and public hearings held at strategic locations within the State.

Critical problems associated with forest practices in North Carolina have been identified by the Committee and include: (1) inadequate forest regeneration, (2) damage to water quality, and (3) low yields of cellulose fiber resulting from incomplete utilization.

More than eight million acres of farm and miscellaneous owned forests are presently inadequately stocked with desirable species and must receive prompt and energetic regenerative action to improve their condition if future timber needs are to be met.

Degradation of water quality from forest practices occurs frequently enough to warrant priority attention. Improperly constructed logging transport systems and logging debris in streams constitute the major impacts on water quality. Cultural practices also cause some siltation of drainages and waterways.

Incomplete or inefficient utilization during harvesting operations is resulting in significantly reduced fiber yields from the forests. Further losses are being sustained because inadequate markets exist for some species and size classes, and economic constraints often prohibit utilization of thinnings and partial cuts.

The Committee concludes, therefore, that these critical problems are of sufficient concern to warrant further attention by the Secretary and the Forestry Council of the Department of Natural and Economic Resources.

The Committee also concludes that voluntary compliance with suitable guidelines is preferable to enforced regulation to correct undesirable forest practices at this time. However, attainment of an acceptable degree of voluntary compliance will require substantially expanded programs of education, training, assistance and incentives to insure that the guidelines are widely understood and adopted.

The Committee recommends to the Secretary of Natural and Economic Resources:

1. That the Natural and Economic Resources Forestry Council be assigned certain functions and responsibilities to assure improvement of the forest resource base and protection of its environmental quality. These functions include establishment and implementation of standard guidelines, the continuation of studies and evaluations of forest practices, and the coordination of forestry efforts among principal agencies, commissions and citizen groups.

2. That a Regional Forest Practices Advisory Committee be appointed in each of the three geographical regions of the State (Coastal Plain, Piedmont and Mountain). Each advisory committee should be composed of seven members representing various interests and should function to provide technical advice and assistance to the Natural and Economic Resources Forestry Council in all matters relating to regional forest practices.
3. That forest practices standards and guidelines be developed for each region of the State. The guidelines would establish operating procedures necessary to attain acceptable productivity, and to assure minimum impact on environmental quality resulting from forestry practices.
4. That legislative or administrative action be initiated to: (a) amend General Statutes 77-13 and 77-14 to provide for effective enforcement of stream clearance following logging operations, (b) amend the Present Use Tax Bill (Senate Bill 416) to liberalize the qualifying requirements of forest lands for deferred tax treatment, and (c) incorporate smoke management guidelines into existing regulations governing prescribed burning in forest lands.

PREAMBLE

Senate Bill 1146 of the 1974 General Assembly directed the Secretary of the Department of Natural and Economic Resources to "conduct studies, hold hearings, and make recommendations to the 1975 General Assembly concerning legislation:

- (1) Designed to assure the continuous growing and harvesting of forest tree species and to protect the soil, air and water resources; including - but not limited to - streams, lakes and estuaries; and
- (2) Designed to coordinate activities among state agencies that are concerned with the forest environment".

The Secretary was further authorized to "appoint a Forest Practices Act Study Committee for the purpose of holding hearings and making recommendations to the Secretary concerning the purposes of (the) Act."

The Bill directed that the Committee be composed of 11 voting members. "Not less than six of the members may be private forest landowners, private forest operators, or authorized representatives of private forest landowners who engage in operations. All members of the Committee shall be qualified by education or experience in natural resource management."

The Legislative charge of the Committee states that "the Committee shall prepare and submit to the Secretary . . . a report covering the need for legislation to regulate forest practices; and if necessary, specific recommendations concerning appropriate legislation which the Committee determines to be necessary to implement the findings of its study."

Upon receipt of recommendations from the Committee, the Secretary is directed to prepare a report for the 1975 General Assembly concerning the need for legislation to regulate forest practices.

Following the directive of the Legislature, the Secretary of Natural and Economic Resources subsequently appointed a Forest Practices Study Committee composed of the following members:

Dr. Ralph Bryant, Forester, Professor of Forest Management, N. C. State University, Raleigh, N. C. and Chairman of the Committee.

Mr. Herman Hermelink, Forester, President, Crescent Land and Timber Company, Charlotte, N. C. and Vice-Chairman of the Committee.

Mr. Quentin Bell, Wildlife Biologist and Practicing Forest Manager, Woodlands Manager, First Colony Farms, Manteo, N. C.

Mr. Howard Beidler, Businessman and Forest Landowner, Asheville, N. C.

Mr. Peter Belluschi, Forester, Woods Manager, Weyerhaeuser Co., New Bern, N. C.

Dr. Thomas F. McIntock, Forester, Retired, Former Director, Southeastern Forest Experiment Station, U. S. Forest Service, Asheville, N. C.

Mr. Fred Mills, Forest Landowner and Former Legislator, Wadesboro, N. C.

Mr. Jim Bridgen, Forester, Division Supervisor, Canal Wood Corp., N. C. Division, Lumberton, N. C.

Mr. Robert E. Shull, Retired Businessman, and Leader of Citizen Conservation Groups and Organizations, Hendersonville, N. C.

Mr. John Weatherly, Forester, District Forester, Catawba Timber Co., Newton, N. C.

Mr. Fred White, Forester, Assistant to the Dean, School of Forestry, Duke University, Durham, N. C.

The Committee received its directions from Secretary James E. Harrington and began deliberations on June 7, 1974.

INTRODUCTION

North Carolina ranks among the five leading states in the Nation in total commercial forest land. Twenty million acres^{1/}, two-thirds of the state's total land area are in forests. Over two billion board feet^{2/} of hardwood and softwood timber is cut from the state's forests each year. Projections made by the U. S. Forest Service indicate a need for doubling production in the South by year 2,000 to meet the demands of the Nation for wood products.

The forest products industry is the third largest revenue producing industry in North Carolina. The wood-using industries of the state produce products valued at over two billion dollars annually^{3/}. Timber harvesting and the manufacture of wood products provide employment for 120,000 workers^{4/} with total annual wages exceeding 780,000,000 dollars^{5/}. Transportation, marketing, and construction attributable to timber production add an additional 524,000,000 dollars^{6/} to the state's economy.

Seventy-nine percent of North Carolina's commercial forest land is held in relatively small tracts by 245,000 private landowners. Twelve and one-half percent is owned by industry, and the remaining 8.5 percent is held in public ownership by federal, state, county and municipal governments. Most of the public ownership is in the National Forests.

State forestry agency personnel estimate that primary products are harvested by approximately 25,000 separate operations each year.

The 1964 U. S. Forest Service inventory revealed a favorable balance of annual forest growth over drain. Although North Carolina's forests have been growing more timber than is cut, successive timber inventories over the past thirty years have shown this favorable balance to be steadily declining, and the break-even point may not be far away. Improved forest practices adopted today will have little impact on timber yield for at least a decade, so action must be taken now to avoid a timber growth deficit situation in the future.

No single program will provide the increased productivity and environmental protection needed in the future. Imaginative and vigorous use must be made of the many approaches available, each of which may contribute a small but ultimately important element to problem solution.

^{1/}Knight, H. A. and McClure, J. P., North Carolina's Timber, U. S. Forest Service Bulletin SE-5, 1966, p. 27

^{2/}Ibid, p. 34.

^{3/}U.S. Dept. of Commerce, N. C. Census of Manufactures 1972; Table 3 - General Statistics for the State by Industry Groups and Industries.

^{4/}Ibid

^{5/}Ibid

^{6/}Winkworth, R. C., Budget Request Justification, N. C. Division of Forest Resources, 1973-74, p. 1

The social and economic values of forests for wildlife habitat, outdoor recreation, and scenic attraction for tourism are self-evident and well documented by use data. Abundant forests provide the base for each of these related activities, and their successful management depends largely on the manipulation of forest stands.

Less evident are the environmental influences of the forests. One of their most important, but least recognized, functions is protecting water quality and regulating stream flow on the watersheds of the state's 16 major river basins and their more than 300 tributary watersheds. Forests also filter the air, modify the weather, buffer sound and contribute to the aesthetic appreciation of almost every outdoor situation.

The foregoing facts bring into focus the complexity of issues relating to forestry practices in North Carolina. Briefly these issues may be summarized in three broad areas of the public interest:

1. How to provide to a demanding public, the benefits of adequate wood fiber production, clean water and air, ample recreation and abundant wildlife from the forest resource;
2. How to meet present and future raw material needs of the wood-using industry and to insure employment for thousands of resident citizens dependent upon the industry for their livelihood;
3. How to educate and activate the quarter of a million small forest landowners and forest operators to adopt good forest practices and assure the benefits of proper forest land management to future generations.

CONDUCT OF STUDY

A. Review of Pertinent Literature

The first task to which the Committee addressed itself following appointment was a review of pertinent literature relating to forestry practices and public regulation of such practices. The purpose of the literature review was to provide background for the Committee's study and to acquaint the Committee members with existing State and Federal legislation, the forest practices in other states, and recorded public reaction to issues surrounding forest practice regulation. Exhibit M of the appendix lists the publications reviewed.

B. Organization and Scheduling of the Study

To fulfill the Committee's obligations in the time allotted required careful planning and tight scheduling for several kinds of activity. There was a need to become familiar with the evolution and functioning of forest practices acts in other states and to profit by their experience. It was important to study forest practices in North Carolina and to assess the nature and severity of problems associated with them. And it was essential to find out how the people of this state regarded such problems and how they felt about the need for forest practices legislation. The following schedule of activities was adopted at the initial meeting of the Committee and was subsequently followed.

June 7	Organization and orientation meeting. Administration Building, Raleigh, N. C.
June 17 20 27	Three informal regional follow-up meetings to allow staff to meet the Committee members in small discussion groups.
July 7-13	West Coast inspection trip. Field inspections of portions of Washington, Oregon and California and discussions with members of the State Foresters' staffs.
July 22-23	Trip to Southern Maine. Discussion with State Forester's staff concerning proposed Maine Forest Practices Bill.
August 7	Committee field trips to view local forest practices
August 8	Regional public hearing, Lexington, N. C.
August 9	Committee-staff executive session
August 21	Committee field trips to view local forest practices
August 22	Regional public hearing, Asheville, N. C.
August 23	Committee-staff executive session
September 11	Committee field trips to view local forest practices
September 12	Regional public hearing, Washington, N. C.
September 13	Committee-staff executive session

October 9	Committee field trips to view local forest practices
October 10	Regional public hearing, Fayetteville, N. C.
October 11	Committee-staff executive session
October 17-18	Working session to outline Committee recommendations and to prepare staff for preparation of initial draft of the Report
November 1	Draft of Report to be sent to Committee for review
November 13	Working session on Report
November 15	Report draft with comments to be returned to staff for final revision
December 4	Final working session
December 15	Final Report presented to Secretary

C. Trips to Other States

During the formative stages of the Forest Practices Study Committee's deliberations, it was decided to investigate forest practices acts in other states. Washington, Oregon and California were selected to be visited because forest practices acts have been in effect for varying periods of time, and Maine was chosen because a Bill has been under active consideration for the past two legislative sessions. Accordingly, visits were arranged to observe forest practices and administrative approaches to forest practices regulation in those states.

D. Public Hearings

Four public hearings were held at strategic locations within the State to obtain ideas, suggestions, and opinions from the public relative to the status of forest practices and the need for forest practices regulation in North Carolina. Public notice was given in advance of each hearing in accordance with state law. Additional notice and publicity were distributed through the news media, hand-out material, and personal contact by the Division of Forest Resources' field personnel. Approximately 500 persons attended the four hearings.

E. Field Trips in North Carolina

Several field trips were taken in North Carolina by committee members to observe forest operations and practices first hand. Seen were techniques and methods being used in North Carolina forestry operations and the impact of these practices on the environment. A total of 15 counties and 70 sites were visited in the course of these trips and included all regions of the state.

F. Forest Practices Impact Survey

In addition to the preceding activities, the Committee directed the Division of Forest Resources to make a statewide survey to evaluate the present status of forest practices in North Carolina and their short-term impact on the forest environment.

Approximately 500 samples of harvesting practices and 200 samples of cultural practices were taken during this survey. Thirty-five professional foresters were used to make field observations and evaluations. An analysis of the survey is included as Exhibit G of the appendix.

G. Writing of the Report

The Committee met in work sessions a total of five days in October, November, and December 1974, to draft its final report.

Findings

A. Status of Forest Practices in Some Other States

The Committee studied the evolutionary process that brought on the need for an act in four other states: California, Maine, Washington and Oregon. It reviewed how the established acts were administered and the impact of the acts on the forest community within the various states. These states represented a wide range of climate, vegetation, soil types, political problems, land ownership patterns, and governmental philosophies. Despite these many differences, however, there were also many similarities and points of general agreement in the content of existing or proposed forest practices acts.

In all cases, development of a forest practices act had required several year's work involving legislative activity, committee appointments, guideline establishment, and administrative implementation.

All of the acts provided for creation of regions or zones within the state to deal with the problems in the diverse forest types. Each region had its own board or committee, composed of both foresters and lay people, to develop regional operating standards. These standards were required to be in compliance with the broad charge spelled out in the basic act and with any standards set by a similar state-level body. A representative of the state forester's office was either officially a member of the state and regional committees or served, by law, as a technical advisor to the groups. Final approval and adoption of the regional standards was by a state forest practices board or committee.

Forest land in the western states is 30-50 percent federally owned. Historically, this land has been subject to federal regulations. This fact may have influenced the citizenry of these states to accept forest regulations when applied to private lands.

In the western states, the large percentage of federally owned land results in a relatively small number of private, non-industrial forest landowners, which eases the burden of administering a regulatory program. The small number of landowners in Maine is not the result of federal ownership, but rather large corporate holdings, particularly in northern Maine.

The four states all reported that the forest practices acts seem to be in an evolutionary period. Changes are being made or proposed by various groups each time their legislatures meet. Citizen group activity had been strong, particularly in the West, and has influenced much of the forest practices legislation in that region.

Cooperation among concerned state and private groups is necessary to make the regulatory process work smoothly. Where clear lines of authority were spelled out in the act, good interagency cooperation was possible, operator and landowner involvement in the rule-making process was enhanced, and a workable, effective program resulted. Where this cooperation was lacking, there were lawsuits, confusion, and at best a cumbersome program that pleased few.

The following brief treatments, state by state, will serve to highlight

some of the more important differences in forest practices acts:

1. California

California's new Forest Practices Act of 1973 took effect on January 1, 1974, but did not become fully effective until October 1974. It replaces a 1945 Forest Practices Act, part of which was declared unconstitutional in 1971, because the regulatory body was not properly constituted. The unconstitutionality issue caused much controversy during the 1972 and 1973 legislative sessions. The present bill has the concurrence of forest industry and most conservation groups.

Of the acts studied, the California Act covers the widest range of regulation and enforcement activities, and is, therefore, quite complicated and difficult to administer.

To meet the requirements of the law, a minimum of four field inspections are required for each individual harvesting job.

Uniform state-wide minimum stocking standards are set in the Act, and these can work a real hardship on a landowner in case of natural disaster, fire, or severe storm. Some relief may be given in extenuating circumstances.

Aesthetics were stressed much more in California than in the other states visited.

Recreation, mountain living, and water production constitute major uses of the forest resource in California. Timber is important, but its importance relative to other resource values is being challenged by the public.

Counties and regional agencies have the authority to write their own forest practices act.

The California Division of Forestry local field foresters have become almost full-time law enforcement officers under this Act.

2. Maine

There was no act in effect, but efforts were being made toward the adoption of one. However, the need for an act, at least in southern Maine, was not evident. The unique species and soils present minimize silvicultural and forest productivity problems characteristic of other regions. Also, laws already in existence could, if properly enforced, correct many of the problems associated with forest practices.

There seemed to be good industry programs of assistance to non-industrial, private forest landowners and southern Maine is fortunate to have excellent marketing opportunities for wood.

3. Washington

An attempt was made in 1973 to pass a Forest Practices Act to

replace one enacted in 1945. The try failed but another attempt in 1974 was successful.

Clear lines of authority were not established in the legislation and conflict has arisen among state and county agencies regarding the supervision of the Act. A lawsuit involving state agencies was under consideration to resolve the problem of jurisdiction.

High stumpage values of some of their timber permit large investments in maintaining site productivity.

Water quality, siltation, and stream temperature were considered to be extremely important because of the great economic contributions of commercial and sport fishing.

Washington's state forestry organization was strongly profit oriented, particularly in its operations on state owned lands that generate funds which contribute to the support of public school systems.

4. Oregon

The 1971 Oregon Forest Practices Act became effective on July 1, 1972. It replaces the 1941 Oregon Conservation Act, whose regulations dealt only with post-logging reforestation.

Oregon appeared to have the most workable forest practices act.

Cooperation among industry, the state forester's office, other state agencies, and the general public has been achieved by careful planning and coordination of objectives.

Over half of the economy of Oregon is dependent on the forest based industries.

Water quality is one of the key resource values.

Regional committees have been successful in establishing forest practice standards to fit individual conditions existing in their areas.

Adoption of a given forest practices regulation requires approval of all the state agencies involved. The subsequent administration of this regulation is then delegated by all state agencies to the State Forester.

B. Public Hearings Testimony

The following summary represents some of the most frequently expressed and significant attitudes or viewpoints in the testimony presented:

Testimony at the public hearings revealed widespread misunderstanding about the nature, severity and duration of the impacts of forest practices.

Much progress has been made in North Carolina over the past ten years toward improved forest practices. Forest industry lands are generally very well managed; industry services to private owners are growing; the Tree Farm Program has been effective; State Division of Forest Resources activities are highly regarded, if too thinly spread; there is an increasing public awareness of the importance of the forest resource to the economic and social well being of the State.

The public accepts temporary environmental disturbance from harvesting but is aware that prolonged adverse impacts are generally unnecessary and should be avoided.

There is little sentiment for abolishing clearcutting, but considerable feeling that it should be done with care, and under some limitations.

There is a basic conflict between regulating forest practices to protect the public interest and the retention of individual freedoms and rights. Each side has its eloquent proponents.

There is much favorable reaction to the idea of guidelines and carefully drawn forest practice standards.

There is a small minority of concerned citizens, representing almost all groups, which says: "We don't want legislative regulation of forest practices but are willing to accept it if it's necessary to get the job done."

There was less extreme polarization of attitudes on controversial issues, and more willingness to try to understand opposing viewpoints, than the Committee expected. However, neither was there a strong, consistent consensus on many major issues or practices.

C. Status of Forest Practices in North Carolina

1. Present Forest Practices Legislation

Present legislation relating specifically to forestry practices consists of General Statute 14-139 and General Statute 77-13 and 14.

General Statute 14-139 is generally referred to as the burning permit law and requires a permit be obtained prior to burning fields or trash near or in woodlands. It is designed primarily as a fire prevention measure to reduce the number of carelessly caused wildfires. It is administered and enforced by the Department of Natural and Economic Resources.

General Statutes 77-13 and 14 prohibit the felling of trees or the deposit of logging debris in streams and waterways. Effective enforcement of this statute is presently lacking because responsibilities for enforcement have not been clearly defined.

Other legislation which might be considered indirectly related to forest practices exists in the form of "care of fire" laws. General Statute 14-136 requires notification of adjoining landowners prior to

burning grass, brush, or woodland. General Statute 14-138 governs the use of campfires in forests, and General Statute 14-140 requires the maintenance of a competent watch on all intentionally set fires.

2. Existing Forestry Programs

Several forestry programs exist that affect forest practices in North Carolina.

a. State and Federal Programs

The Division of Forest Resources of the N. C. Department of Natural and Economic Resources, with financial support from the U. S. Forest Service, provides free technical advice and assistance to small, private landowners in the proper management of their forest land. This assistance is limited to five days per year for each landowner. The Division also offers tree seedlings and custom cultural services on a cost basis to assist owners in reforestation and improving unproductive woodlands.

A very small percentage of forest owners participate in these programs. This is due to unawareness and indifference on the part of landowners and also to the limited number of service foresters and technicians available to render management advice and assistance. There is a tremendous need for expanded educational and service programs, which means substantially increased commitments of money and manpower.

A Federal Incentives Program administered through the Agricultural Stabilization and Conservation Service offers cost sharing assistance to private landowners for reforestation and timber stand improvement purposes. The N. C. Division of Forest Resources is responsible for the technical assistance requirements of this program.

The Forestry Extension Service, Soil Conservation Service, and the Soil and Water Conservation Districts provide forestry advice and assistance to private landowners and operators. North Carolina State University and Duke University Schools of Forestry, and the U. S. Forest Service have active research programs in many phases of forest land management.

b. Industry and Other Private Programs

The Forest Industries own and control large operations in the Coastal Plain and Piedmont. Generally, good management is practiced on these lands under the supervision of professional foresters.

Although few in number, private consultant foresters are available throughout the state to clients on a fee basis. These professional foresters provide advice on silvicultural practices, supervise harvesting operations, and assist with reforestation on private lands.

Most harvesting operations and forest cultural work, such as mechanical site preparation, are done by independent private operators.

They are often small, family-owned businesses and in some instances work only part time in forest operations. These operators are usually knowledgeable and skilled in their trade but often are not cognizant of the relationship between their operations and environmental concerns.

Industry sponsorship of the Tree Farm and similar programs is well recognized as an important contribution to farm forestry. Industry supported small landowner assistance programs have been recently initiated and their rapid growth points toward successful establishment of these programs.

D. Problems Associated with Forest Practices in North Carolina

The Committee has identified specific problems concerned with forest production, visual quality, water quality and air quality. Further study will be required to thoroughly evaluate and quantify these problems and to determine the need for and means of alleviating them.

1. Forest Production

a. Problems of Regeneration and Site Productivity

Previous statements have called attention to North Carolina's role in the production of wood fiber for the future. Presently, eight million acres of farm and miscellaneous owned forests are inadequately stocked with desirable species^{7/} and 61 percent (±159,000 acres) of the harvests within the last three years remain inadequately stocked where cultural practices have not been carried out to insure suitable regeneration^{8/}. Adequate regeneration of these acres is a minimum necessity, and should be a high priority goal throughout the state. Opportunities exist for dramatic increases in per acre productivity for most of these acres through intensive forestry practices involving complete site preparation, fertilization and the use of genetically improved planting stock.

b. Utilization

Incomplete or inefficient utilization during harvest results in a significant loss of timber production. In part, this arises from failure of the operator to cut and market all locally merchantable trees, leaving much usable fiber in the woods. Poor design of the logging job, operator carelessness or inexperience, lack of supervision and perhaps other factors may also result in substantial amounts of merchantable material being broken, improperly harvested or left on the ground. A more serious common problem, however, is the inability to sell trees for which there is no available market. Pulpwood size hardwood trees, for example,

^{7/} Knight, H. A. and McClure, J. P., North Carolina's Timber, U. S. Forest Service Bulletin SE-5, 1966, p. 27.

^{8/} N. C. Division of Forest Resources, Impact Survey, 1974.

which may have a ready market in some localities cannot be sold in other areas. This material not only represents a loss of production, but also serves to make regeneration more difficult and expensive. The Forest Practices Impact Survey showed that only 55 percent of the harvesting operations resulted in good utilization of material.

Thinnings and partial cuts are necessary operations for good growth and vigor in most forests. In the past, a ready labor supply and low operating costs made partial cutting economically feasible. Today, the labor market is limited and contractors must rely on expensive machinery to stay in business. Most of this machinery is not designed for thinnings, nor will the economics of logging justify its use in low yield partial cuts. The inability to perform these necessary operations is resulting in lost production and reduced growth in North Carolina's forests.

c. Insects, Diseases, Wildfires and Storms

Catastrophic losses from insects, diseases, wildfires, ice storms, and wind damage take an additional toll from the forest's timber producing capability. A total of 51.6 million board feet^{9/} of sawtimber, and an additional 19.7 million cubic feet^{10/} of growing stock are lost to insects, diseases and wildfires annually. The Division of Forest Resources reports 42 million board feet of sawtimber and 85 thousand cords of pulpwood were killed by the southern pine beetle in 1974 and salvaged through the Division's control efforts. It is estimated that an additional 20 million board feet and 40 thousand cords could not be salvaged and were lost.

Wildfires burn an average of 84,000 acres annually with a resource loss of nine million dollars.^{11/}

d. Soil Quality

Forest practices that result in topsoil erosion, compaction, flooding or removal reduces site productivity. The Committee saw virtually no surface erosion following timber cutting per se. However, evidence of substantial soil movement was frequently observed on logging roads and skid trails. The Forest Practices Impact Survey reported some road and trail erosion on 50 percent of the areas sampled, and 30 percent were still active. This can be traced primarily to two causes: (1) location and construction improperly done on 38 percent of the operations which failed to provide for adequate dispersal and drainage of water; and (2) in 77 percent of the sample areas,

^{9/}Knight, H. A. and McClure, J. P., North Carolina's Timber, U. S. Forest Service Bulletin SE-5, 1966, p. 32.

^{10/}Ibid., p. 32.

^{11/}Winkworth, R. C., Budget Request Justification, N. C. Division of Forest Resources, 1973-74, p. 6.

roads and trails had not been "put to bed" or stabilized after logging. Some erosion also occurred on 58 percent of the sites where equipment was used to prepare the soil for regeneration. This seemed to be a temporary situation and little soil loss was noted.

Increasing use of large rubber tired skidders upon specific soil types when wet is leading to soil compaction which may significantly degrade site quality on perhaps as much as 15 percent of harvested areas. Site degradation is likely to be especially critical if compaction is associated with flooding. The Impact Survey encountered some compaction on 74 percent of the logging jobs sampled, and on 66 percent of the cultural operations. Most of this was classified as "slight".

In certain site preparation practices, topsoil may be scraped from the surface and deposited in windrows with the brush and other debris. Survey results show this to have occurred in 11 percent of the areas examined.

These types of soil damage are not believed to represent a significant impairment of productivity so far for the State as a whole, although inexperienced or careless equipment operators have occasionally created serious local problems. Nevertheless, as efforts are intensified to increase timber production in the State, opportunities for preventing loss or destruction of topsoil must not be overlooked.

e. Wildlife

An unintentional by-product of most timber harvesting practices is an improved habitat for many species of birds and animals. A variety of herbaceous and woody plants rapidly revegetate the ground providing food and cover. Den trees, often in the form of old culls, are left and at least a scattering of smaller overstory trees remain for nesting. However, a property under intensive timber management, which is given thorough site preparation and planted to a single tree species, may produce conditions inimical to wildlife after a few years. If such tracts cover large areas and no provision is made to retain or create adequate habitat, wildlife populations may suffer. Also, scarce, endangered, or unique species, such as the osprey and the red cockaded woodpecker, often require rather narrowly defined habitat conditions, and a special effort may need to be made to preserve them where they exist, or to establish them where they do not.

The Committee was unable to determine whether any important timber-wildlife conflicts now exist in the State. This is, however, an area of potential concern that justifies study, particularly since it is likely that relatively minor modifications of prevailing forest practices can alleviate or eliminate serious damage to wildlife where it does occur.

2. Visual Quality

Visual quality is an important component of the forest environment which is subject to at least some degree of management.

The Committee attempted to evaluate the impact of forest practices on visual quality within the diverse regions of the State.

Trees planted in monotonous rows and large unbroken blocks are unsightly to some people. Conspicuous logging decks, landings, and trash left by woods crews impair visual quality, as do excessive logging slash and unused residual trees left by loggers. Clear cutting is the most often cited objectionable forest practice relating to visual quality. Observations of the Committee and public hearing testimony confirm that the visual impact of clear cutting can be modified when desired.

3. Water Quality

Degradation of water quality resulting from forest practices occurs frequently enough to warrant priority action by the Forestry Council of the Department of Natural and Economic Resources. The impact survey, based on professional forester judgment, revealed apparent short term damage to water quality in 28 percent of the harvesting operations and in 14 percent of the site preparation operations. Some physical damage to streams and water courses is also occurring, caused primarily by logging slash in streams, improper skidding, and poorly designed logging road crossings. Siltation, resulting from both harvesting and cultural practices, was observed during the course of the field trips. Failure to leave filter strips and shade along streams was also noted. Removal of all vegetation adjacent to streams may contribute to the siltation problem and cause an increase in water temperatures. This change in temperature can be detrimental to fish environment, especially that of trout in the mountains. The relationship of forest practices to water quality needs further study and quantification.

The recently enacted State law regulating the application of pesticides seems to be operating satisfactorily, insofar as forest operations are concerned. It is possible that with expanding aerial applications of fire retardants and forest fertilizers, a water pollution problem could develop from these sources, and this should be watched.

4. Air Quality

Forestry practices bearing on air quality are confined to the single practice of using prescribed or controlled fire to achieve one of several objectives. Prescribed fire is used to control diseases and unwanted vegetation, improve wildlife habitat, prepare areas for regeneration, and to reduce hazards from wildfire. For some of these uses it is the only feasible practice for the management objective. In other cases, it is environmentally preferable to alternatives, such as chemicals. Its use for hazard reduction produces much less smoke emission and air pollution than would result from the wildfires it is

designed to prevent.

Smoke management guidelines are currently being evaluated by the Department of Natural and Economic Resources, Division of Forest Resources. These guidelines establish criteria and standards which result in the use of prescribed fire only under conditions that assure minimim impact on air quality. These guidelines have been developed with assistance from the Department of Natural and Economic Resources, Division of Environmental Management and the National Weather Service.

Unfavorable weather, shortage of trained personnel, and diversion of personnel to other management activities have frequently reduced the area which could be burned by prescription. This has jeopardized control of losses by wildfire.

PHILOSOPHY

The Committee has adopted the following philosophy as a framework of reference for its subsequent conclusions and recommendations.

- A. Full forest production necessitates the continuation of present good practices and the application of additional practices.
- B. Education, training, incentive, and assistance programs are all preferable to strict regulation.
- C. Flagrant abuses of the forest environment must be stopped.
- D. The inherent rights of private landownership must be protected, but the Committee believes there is a social responsibility attached to such ownership, as well.
- E. Problems relating to future forest productivity and environmental care are complex, and their solutions will require a coordinated effort from all forest resource interests.
- F. Forestry problems are not static but will require a dynamic approach and a continuous effort for their solutions.

CONCLUSIONS

The Committee has arrived at the following conclusions:

- A. The complexity of designing and administering a comprehensive forest practices act justifies greater time commitments for study and formulation than have been available to the Committee.
- B. Voluntary compliance with standard guidelines for forest practices is preferable to enforced regulation. A program of education, training, and financial incentive to encourage compliance is desirable. However, regulation must be considered if voluntary compliance fails.
- C. Unfavorable environmental impacts from forest practices are occurring. Although currently of a local and sporadic nature, they are of sufficient concern to warrant continuing study of methods to minimize these impacts.
- D. Regeneration of unproductive forest land is a high priority problem requiring prompt attention and action.
- E. The administration of any program directed toward the improvement of forest practices requires a unity of philosophy and purpose on the part of all governmental units involved. The control of such a program must be vested in one office.
- F. North Carolina's diverse and varied forested regions require flexibility in the adoption of standard operating procedures or guidelines.
- G. Limitations imposed by availability of markets for all potentially merchantable material constitute a major block to improved forest practices.
- H. A serious drawback to better forest practices in the Mountains and Piedmont is lack of knowledge about intensive hardwood culture and management.
- I. Prevention of soil and water damage associated with harvesting and cultural practices is relatively easy to achieve; that is, the know-how is available and costs for doing it are not prohibitive. This is not always true of the regeneration problem.
- J. The large number of small private forest owners (nearly 250,000) and the number of "operations" each year (about 25,000) makes a tight, comprehensive system of permits, inspections, reports, and appeals impracticable. The cost and work load of administering such a system would be very great.

RECOMMENDATIONS

The following recommendations are made to the Secretary of the Department of Natural and Economic Resources:

A. The Functions and Responsibilities of the Natural and Economic Resources Forestry Council Relative to Forest Practices

The Committee recommends that the Forestry Council of the Department of Natural and Economic Resources be assigned functions and responsibilities including the following:

1. To assure improvement of the forest resource base and protection of its environmental quality by:
 - a. Continuing the Forest Practices Study Committee's charge to further evaluate environmental impact of forest practices, including, but not limited to, those recognized by the Committee, and explore ways to reduce such impact.
 - b. Continuing the study and evaluation of measures required to increase the productivity of private forest land.
 - c. Identifying high priority research needs and virorously supporting such research efforts.
 - d. Coordinating activities of the Regional Forest Practices Advisory Committees.
 - e. Establishing Regional Forest Practices standards and guidelines for North Carolina and working with appropriate groups to get such adopted.
 - f. Developing the framework for a forest practices act designed to meet the future need for regulation, as may be demonstrated by further experience and knowledge.
2. To establish and actively maintain liaison with other state and federal agencies, Citizen Boards, Councils, and Commissions concerned with forest practices.
3. To review priorities and evaluate the quality of the Division of Forest Resources programs and to make recommendations for improvement to the Secretary of Natural and Economic Resources.
4. To monitor public opinion relating to forest resource economics, use, and management within the overall framework of state land use, and to advise the Secretary of Natural and Economic Resources of changing trends.
5. To be responsive to actions by the Federal Environmental Protection Agency relating to non-point source pollution from forest practices.

B. Regional Forest Practices Advisory Committees

The Committee recognizes a need for establishing forest practices standards and guidelines for North Carolina. The Committee further recognizes that because forestry practices and their effects vary according to geographic conditions, standards and guidelines should be developed and established by geographic regions. The Committee, therefore, recommends that the Secretary of Natural and Economic Resources appoint three seven-member Regional Forest Practices Advisory Committees, one in the Coastal Plain, one in the Piedmont, and one in the Mountain Regions of the state. To facilitate the use of statistical data, the regional boundaries should agree with the U. S. Forest Service survey boundaries as shown on Exhibit I of the appendix. The Regional Forest Practices Advisory Committees should function to provide technical advice and assistance to the Forestry Council of the Department of Natural and Economic Resources in all matters relating to forest practices.

The Committee further recommends that membership of each Regional Forest Practices Advisory Committee be composed of one non-industrial forest landowner, one representative of the forest industries, one citizen interested in conservation, one forest operator, one representative of the forestry profession, and two at-large members. A minimum of three members should be professional foresters. All members should have a demonstrated interest in forestry. A forester designated by the Director of the Division of Forest Resources should serve as a non-voting technical representative to each Regional Committee.

C. Specific Problem Areas Identified by the Committee

The Committee recommends to the Secretary that the following action be directed toward specific problems identified in the body of this report.

1. Forest production

- a. Establish long-range timber productivity goals for commercial forest lands of the State.
- b. Develop and encourage the adoption of regional standards for acceptable reforestation of cutover or unproductive forest land, and guidelines for harvesting and regeneration practices that will result in attainment of those standards.
- c. Strengthen existing Division of Forest Resources programs of landowner assistance.
- d. Develop a legislative proposal for a State incentive program to supplement the existing Federal Forestry Incentive Program.
- e. Obtain additional funding to enlarge the Division of Forest Resources' tree improvement, nursery, and forestation programs as needed to support expanding incentive programs.
- f. Consider the following procedures to minimize destructive logging, poor site preparation, and wasteful utilization practices.

- (1) Train operators
 - (2) License operators
 - (3) Recognize good operators with certificates of competence
 - (4) Improve timber sale agreements and encourage landowner sale supervision
- g. Take positive action in support of research designed to develop silvicultural and harvest systems suitable for small ownerships and initiate the development of equipment that will improve the economic feasibility of partial cuttings and thinnings.
- h. Strengthen insect and disease control capability and ability to recover losses from catastrophic disasters by:
- (1) Supporting intensified research in insect and disease control
 - (2) Providing administrative procedures that will allow a revolving fund for the Division of Forest Resources to finance emergency control measures
 - (3) Investigating practicality of storing damaged wood to prolong merchantability
- i. Develop additional regional guidelines in cooperation with the North Carolina Wildlife Resources Commission to protect the environment of endangered wildlife species and enhance the habitat of game and non-game species.

2. Visual Quality

Develop and encourage adoption of regional guidelines to minimize the visual impact of harvesting and cultural practices by establishing standards for such things as vegetative screens on harvesting and cultural operations, size and shape of clearcuts, log deck and landing locations, and logging road location and construction.

3. Water Quality

a. Develop and test regional guidelines for the following purposes:

- (1) To minimize siltation caused by improper location, construction, and maintenance of logging roads and skid trails
- (2) To provide filter and/or shade strips along perennial flowing streams
- (3) To prevent damage to stream banks and water courses by forest operators when crossing or logging near streams
- (4) To assure the protection of surface waters from contamination by chemicals used in forest practices

- b. Require compliance of above guidelines as a prerequisite for incentive payment qualification under future state programs and investigate feasibility of including these guidelines in present federal incentives programs
- c. Establish procedures necessary to encourage compliance with the regional guidelines and assure the early elimination of flagrant abuses of water quality.

D. Legislative and Regulatory Action

- 1. It is recommended that a Bill be submitted to the North Carolina Legislature to authorize the Secretary of the Department of Natural and Economic Resources to continue the study initiated by the Forest Practices Study Committee and to make periodic reports back to the Legislature.
- 2. Amend General Statutes 77-13 and 77-14 ("Debris in Streams") to provide for effective enforcement.
- 3. Amend Senate Bill 416 ("Present Use Tax Bill") to liberalize the requirements for qualification of forest lands for deferred tax treatment.
- 4. Include the Smoke Management Guidelines as a required procedure for burning in forest lands.

E. Recommendations for Implementing Programs

1. Financing and Incentives

Investigate the following sources of revenue as possibilities of funding the preceding recommendations requiring establishment of new programs or expansion of existing programs.

- a. Severance tax on forest products
- b. Conversion tax
- c. General fund sources
- d. License fees
- e. Federal cooperative funds
- f. Income from state contractual services
- g. Expensing of cultural operations in State and Federal Income Tax treatment

2. Education

Utilize the following for training and educating those directly concerned with improving forest practices.

- a. Training for forest operators in Technical Institutes
 - b. Demonstrations, workshops, and seminars for forest operators conducted by:
 - (1) Extension Service
 - (2) Vocational Agricultural Departments
 - (3) Division of Forest Resources
 - (4) Forest Industries
 - (5) Equipment dealers
 - (6) Soil and Water Conservation Districts
 - (7) U. S. Forest Service
 - c. General information and education programs through federal, state, and private agencies to heighten the awareness of forest landowners to the important need for proper stewardship of their land.
3. Regulation or Enforcement
- Investigate the feasibility and desirability of the following procedures:
- a. Registration or licensing of forest operators
 - b. Requirement of landowners or operators to notify the Department of Natural and Economic Resources prior to initiating logging operations.
 - c. Certification of qualified consultant foresters
 - d. Licensing of professional foresters

APPENDIX

- A. Photos of Selected Forestry Operations
- B. Flyer on Public Hearings
- C. Testimony and Written Statements of Public Hearings
- D. General Statutes
- E. Act Authorizing Study Committee
- F. Other States' Forest Practices Acts
- G. Analysis of Impact Survey
- H. Smoke Management Guidelines
- I. Map of Regional Boundaries
- J. North Carolina's Timber
- K. 1973-75 Budget Request Justification Statement
- L. North Carolina Pesticide Law
- M. Citations from Handbook

Note: Due to the bulk of the material making up the appendix, only two complete appendixes will be published at this time. These will be maintained at the Secretary's office, Department of Natural & Economic Resources, and at the State Forester's office. This material will be available for review at either of these two locations.

APPENDIX

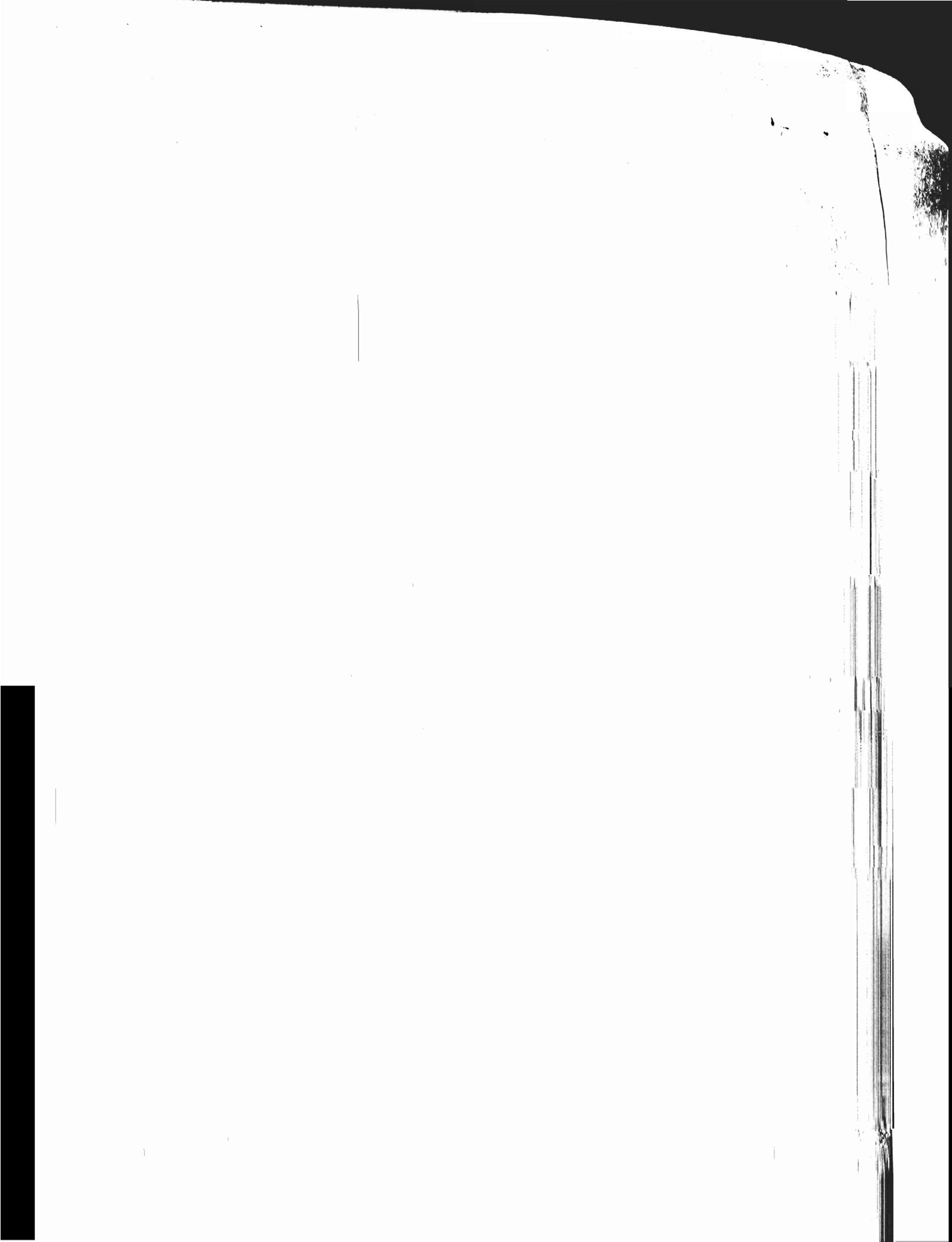
- A. Photos of Selected Forestry Operations
- B. Flyer on Public Hearings
- C. Testimony and Written Statements of Public Hearings
- D. General Statutes
- E. Act Authorizing Study Committee
- F. Other States' Forest Practices Acts
- G. Analysis of Impact Survey
- H. Smoke Management Guidelines
- I. Map of Regional Boundaries
- J. North Carolina's Timber
- K. 1973-75 Budget Request Justification Statement
- L. North Carolina Pesticide Law
- M. Citations from Handbook
- N. Individuals Corresponding with Committee

SOURCE DOCUMENTS

1. "Water Strategy Paper;" U.S. EPA; Washington, DC; February 29, 1973, and April 30, 1973.
2. Public Law 92-500; 92nd Congress; October 18, 1972; "Federal Water Pollution Control Act of 1972."
3. "Statement on Forest Practices Study Committee Bill," Ralph C. Winkworth, Division of Forest Resources, DNER, February 1974.
4. "North Carolina Forest Practices Study Committee Act," 1973 Session (2nd Session 1974), Ch. 1029, Senate Bill 1146.
5. "Silvicultural Project on Nonpoint Sources of Pollution Control Study," EPA. Memorandum by Dr. T. E. Maki; NCSU School of Forest Resources; March 30, 1974.
6. "Oregon Forest Practices Act;" ORS 527.610 to 527.730 and Subsection ORS 527.990; July 1, 1972.
7. "Z-Berg-Nejedly Forest Practices Act of 1973," Div. 4, Ch. 8, Pub. Res. Code. Effective January 1, 1974; California.
8. Second Substitute House Bill 637, "An Act Relating to Forest Practices." Passed February 14, 1974; State of Washington.
9. Legislative Document No. 2500, Maine, "An Act Creating the Maine Forest Resources Regulation Act."
10. "An Environmental Law - The Federal Water Pollution Control Act Amendments of 1972 - Highlights;" U.S. EPA; Washington, DC; January 1973.
11. "USDA Briefing Document (2/1/73) on Water Quality Act Amendments of 1972," (Provisions involving agriculture).
12. "Nonpoint Sources of Pollution;" USDA-FS (File 1310); January 28, 1974; (Barry R. Flamm).
13. "Federal Water Pollution Control Act Amendments of 1972;" USDA-FS (File 1020); September 20, 1973; (Philip Thornton).
14. Draft Contract Statement, "Information on Methods to Control Pollution from Silviculture Activities;" USDA-FS (8420); August 23, 1973.
15. "Process, Procedures, and Methods to Control Pollution Resulting from Silvicultural Activities;" EPA 430/9-73-010.
16. "The Challenge of the Environment - A Primer on EPA's Statutory Authority;" December 1972, U.S. EPA; Washington, DC.
17. "An Environmental Law - The Federal Environmental Pesticide Control Act of 1972 - Highlights;" U.S. EPA; Washington, DC.

18. "Prevention of Significant Air Quality Deterioration;" USDA-FS (1020); October 25, 1973; (Gene S. Bergoffen).
19. "Forest Lands Restoration and Protection Act of 1971," H.R. 7383 (S.B. 1734), Division of Forest Resources, Staff Brief.
20. "Land Policy Act of 1974," N.C. General Assembly, 1973 Session (2nd Session 1974), Ch. 1306, Senate Bill 857.
21. "Coastal Area Management Act," N.C. General Assembly, 1973 Session (2nd Session 1974), Ch. 1284, Senate Bill 972.
22. "North Carolina Sedimentation Pollution Control Act of 1973," 113 A-50 through 113 A-66. Effective July 1, 1973.
23. "Amendments to Sedimentation Pollution Control Act," General Assembly of North Carolina, 1973 Session (2nd Session 1974), Ch. 1417, Senate Bill 1185.
24. "Rules and Regulations for Erosion and Sediment Control;" April 10, 1974; N.C. Sedimentation Control Commission.
25. Ch. 77, "Rivers and Creeks;" 77-13, "Obstructing Streams a Misdemeanor;" 77-14, "Obstructions in Streams and Drainage Ditches: North Carolina State Laws."
26. "Field Guide to Oregon Forest Practices Rules;" July 1, 1973; Oregon Dept. of Forestry.
27. "Administrative Procedures - California Forest Practices Act," California Division of Forestry.
28. "Field Guide to Washington Forest Practices - Guidelines for 1974," Washington Dept. of Natural Resources.
29. "Focus on the Issues," Journal of Forestry, p. 196, April 1974.
30. "Trends and Aspects of Forest Legislation in Germany," R. Plochmann, Journal of Forestry, p. 202, April 1974.
31. "State Forest Laws Today," William C. Siegel, Journal of Forestry, p. 208, April 1974.
32. "Farewell to the Simple Formula, An Introduction;" John H. Beuter; Journal of Forestry; p. 212; April 1974.
33. "Can Regulation Contribute to Economic Stability," Con. H. Schallau, Journal of Forestry, p. 214, April 1974.
34. "The Geographic Basis," Dennis E. Teeguarden, Journal of Forestry, p. 217, April 1974.
35. "The South - An Unregulated Forest Region," Walter C. Anderson, Journal of Forestry, p. 221, April 1974.

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This is the background material originally gathered for the committee. As the committee conducted its study, additional items were added to the basic list. The following list is a compilation of some of the added material the committee found useful.

1. "Forest Resource Development Act," Senate Bill 2200, 1974, Mississippi.
2. "Report of the Trees for Tomorrow," Task Force of South Carolina (5/24/74), S.C. Commission of Forestry.
3. "Reforestation of Timberlands" (Sections 10-90.20 through 10-90.29, Title 10, Ch. 4, Article 9:1), General Assembly of Virginia, 1970.
4. The text of the "Environmental Policy Act of 1971" (113 A-1 through 113 A-10), Laws of North Carolina, Implementation Guidelines for Act.
5. Draft copy, "Channelization," N.C. Water Plan Coordinating Committee, January 1974.
6. Information package, Division of Forest Resources, N.C. Forest Service (FY 73-75).
7. "The Muddy Road to Clean Water," Michael Green and Scott Flander, American Forests, p. 25, June 1974.
8. "EPA Studies on Nonpoint Water Quality;" National Forest Products Association; June 3, 1974.
9. "Summary of the Model State Forest Practices Act;" NFPA; August 17, 1973.
10. "Why State Forest Practices Acts Are Needed," Script for slide lecture, Weyerhaeuser Timber Co.
11. "North Carolina's Timber," U.S. Forest Service Resource Bulletin, SE-5, 1966.
12. "Water Quality After Clearcutting a Small Watershed in Virginia;" Aubertin and Patric; Journal of Environmental Quality; Vol. 3, No. 3; p. 243; 1974.
13. "Measurement of Reaction to Forest Practices," Willhite and Sise, Journal of Forestry, p. 567, September 1974.
14. "Managing for Natural Regeneration," Williston and Balmer, USDA-FS, SE Area, S & PF, July 1974.